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GRAY PINE AND ARBOR-VITAE.

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IN an interesting article in RHODORA, xxi. 41-67 (1919), Professor Fernald has stated that *Pinus Banksiana* is confined to acid soils, *Thuja occidentalis* chiefly to basic soils, reaching its maximum development and its outlying stations only in positively calcareous areas. A railway trip taken in June, 1921, in a region not very well known botanically, gave the writer an opportunity to make from the car windows some observations upon these two conspicuous species, and his notes may be worth concise presentation as evidence supplementary to that offered by Professor Fernald. •

Across the southern part of the upper peninsula of Michigan, from Gladstone to Manistique, barrens with *Pinus Banksiana* (and scattered *Pinus resinosa*) were seen, but there was no *Thuja* near these species. Along the line of the Algoma Central and Hudson Bay Railway, from Sault Ste. Marie, Ont., northward for nearly three hundred miles I made the following notes, the mileages given being those from Sault Ste. Marie. Near Frater (mile 102) Gray Pine was reported to me by an old resident as being very scarce; he had seen but two trees of it in an experience of many years. Near O'Connor (mile 126) the first trees of the species visible from the railroad began to appear; beyond Agawa (mile 131) they became common, continuing near Tabor (mile 141), and largely found as a second growth after fires. Beyond Limer (mile 156) there are barrens with *Vaccinium pennsylvanicum* and its var. *nigrum* and Gray Pine. During all these observations of Gray Pine which I have mentioned no *Thuja* was seen anywhere in the neighborhood. Near Hawk Jc. (mile 165), however, both are found,

Thuja in bogs, *Pinus Banksiana* on dry ridges, sometimes not more than two hundred feet from the *Thuja*, and north of Alden (mile 173) the two were seen within twenty-five feet of one another, but it was noteworthy that the cedars were on a shore, close to water, and the pine on a gravelly ridge. Beyond Dreany (mile 182) the pine descends into bogs, in company with *Larix*, but the character of the soil in these is betrayed by the abundant presence of *Ledum groenlandicum* and no *Thuja* was seen in them. A little farther north the pine forms thick stands upon the drier ground, but soon after disappears. Between Franz (mile 195) and Hearst (mile 296) there are large calcareous areas, for example at Gray (mile 229) and Akron (mile 233), with such characteristic plants as *Valeriana uliginosa* and *Lonicera involucrata* and, of course, *Thuja*, and along this stretch, as well as from Hearst eastward for one hundred and thirty miles to Cochrane, I saw no Gray Pine. East of Cochrane, however, on the line of the National Transcontinental Railway, I was able to make some further observations (the mileages being this time those from Quebec). East of Norembega (mile 559) the first Gray Pine appeared, and near Lake Abitibi (about mile 531) young trees of it grew infrequently by the railroad track, as though adventive. *Thuja* was also seen, but in bogs, and the two were not seen together. East of Balkam (about mile 515) was Gray Pine unaccompanied by *Thuja*; east of Authier (mile 470) it was found in company with much *Kalmia angustifolia*; about Amos (mile 433) it was abundant, but always without cedars. Its presence or absence in a distance of two hundred miles which I passed after dark I cannot describe, but the next day I saw it near Ferguson (mile 181), and near La Tuque (mile 129) it and *Pinus resinosa* were seen on ridges, with *Thuja* in low swampy ground.

Naturally these observations lose much of their value without the control of careful soil tests, which in a trip of this sort were obviously impossible. Yet it may be safely be stated, so far as my observations go, that whenever *Pinus Banksiana* and *Thuja* were both present at one locality there was visible, even at a hasty glance from the train, some decided difference in their habitats. That this difference, as I have described it at Hawk Jc. and Alden, depended upon something more than a mere question of moisture may also be inferred from the fact that the pine was by no means limited to dry ridges, as the station which I have described near Dreany well showed. *Pinus Banksiana* will apparently grow either upon dry sandy (or rocky) barrens or in wet

peat bogs, but not in the soil conditions necessary for *Thuja*, and *Thuja*, as Professor Fernald well remarks in his article, will grow in habitats either boggy or well drained, but not in the soil conditions, whatever these may be, required by *Pinus Banksiana*. To this extent, then, my observations appear to corroborate the conclusions of Professor Fernald.

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NOTES FROM THE WOODS HOLE LABORATORY,—1921.

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(Plate 133)

PLATYMONAS SUBCORDIFORMIS (Wille) Hazen.—In the summer of 1917 a unicellular green organism was found in a small tide pool on Black Rock, near the entrance to New Bedford Harbor. It was considered to be a new American species of the genus *Platymonas* West¹ until Dr. Tracy E. Hazen established and called attention to the fact that it is identical with Wille's *Carteria subcordiformis*.² Dr. Hazen's account is reproduced at the end of this note.

The organism has been found in each succeeding summer in the same locality, and Dr. Hazen records its occurrence elsewhere in Massachusetts and in New York, as well as in England and Norway. At the Black Rock station it has been consistently abundant in certain pools. The rock is a haunt of gulls, and the water containing the *Platymonas* is at times so fouled with excrement as to give off a decidedly unpleasant odor. It seems, like certain other Chlamydomonads, to flourish best in the presence of organic pollution. It can endure a range of salinity from that of almost fresh, or quite fresh (Wille), water to that of sea water.

The cells are small, varying in length from 13 to 17 μ , in breadth from 7 to 8 μ , in thickness from 4 to 5 μ . In surface view (pl. 133, figs. 1-3) the cells are oval and flattened. One face is convex, while the other is nearly flat (fig. 4).

The usual vegetative phase is actively motile with the anterior end

¹ West, G. S. Algological notes XVIII-XXIII. *Journal of Botany* 54: 1-10. 1916.

² Wille, N. Algologische Notizen IX. Ueber eine Art der Gattung *Carteria* Diesing. *Nyt. Mag. Naturvid.* 41: 89-94, Taf. 3. 1903.